

# ON-BOARD SOFTWARE FOR THE MARS PATHFINDER MICROROVER

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The Pathfinder Microrover Flight Experiment will perform engineering and science experiments on the Martian surface to pave the way for future Mars missions. The rover is controlled by a 1970's era microprocessor. Its on-board software, while in some ways a typical embedded-system design, has to deal with some unusual constraints.

The rover will be operating in a harsh and mostly unknown environment, with limited electrical and processing power, accessible only via a limited-bandwidth communication link with long time delays. The software design is driven by these factors to provide reliability in the face of hardware, software, and operational failures, flexibility to allow adaptation and reconfiguration, simplicity, predictability, and visibility into its internal state and the external environment.

This paper describes the overall software structure, and details some of the more interesting features of the design, including error handling, power control logic, and navigation with hazard avoidance. The development environment is also described, including the use of world-wide-web-style hypertext to provide quick access to the collection of documents that accumulate in a software project.